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Betreff: **International Patent Application PCT/EP2003/012527**
NUVERA FUEL CELLS EUROPE S.r.l.

As discussed on April 15, 2005 with examiner Wiedemann on the phone on, the IPER dated April 4, 2005 has been established after a first rationalised written opinion so that applicant had no chance so far to consider and to reply to specific objection of the examiner in the detailed examination proceedings.

The examiner has confirmed that under these circumstances, he would be prepared to consider newly filed amendments/arguments and issue a new IPER afterwards.

Thus, applicant would like to reply to the objections raised in the IPER of April 4, 2005 as follows:

1. Amended documents

Attached, a complete set of amended claims 1 - 15 is herewith submitted in triplicate to replace claims 1 - 16 as originally filed.

New claim 1 comprises the features of original claims 1 and 2. New claims 2 - 15 correspond to original claims 1 - 16.

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2. The subject matter of new claim 1 meets the requirements of Art. 33 PCT

- 2.1 In the IPER of April 4, 2005, the examiner considered the arguments initially provided in applicants' request for detailed examination dated 10.11.2004 to support the present application as non convincing. In particular, the Examiner has interpreted claim 1 as referring to an electrochemical generator comprising porous current collectors which correspond with feeding devices and extracting devices, adding that *"the asymmetric pressure drop is firstly not a product feature but defined as a "result to be achieved" and is linked to the feed and/or extraction device and not to specific parts of the units"*.

In contrast to examiner's initial understanding of the present invention, applicants would like to draw examiner's attention to the fact that even in the original wording of claim 1, the feed and extraction devices are defined as specific parts of the elementary cells making up the electrochemical generator.

This feature is clearly described in the present specification. The feed and extraction devices may for instance be comprised of feed/discharge manifolds, formed by suitable holes in the cell elements assembled in a filter-press configuration (see for instance page 3, last paragraph), and of distributing/collecting channels obtained inside each elementary cell.

Applicants are confident that the newly submitted main claim makes sufficiently clear that the feed device and the extraction device characterised by different pressure drops are specific parts of the elementary cell.

In view of such claim amendment, Applicants respectfully solicit full reconsideration of the initially submitted arguments:

2.2 The subject matter of new claim 1 is neither anticipated by D1 nor by D2.

In particular, novelty of claims 1-5, 7-9, 11 and 15 was challenged in view of documents D1 (EP 0 999 605) and D2 (US 3,926,676).

Applicants wish to point out that the amended claim 1, which includes the limitations of the original claim 2, renders this objection moot.

Both D1 and D2 fail to teach an electrochemical generator made up of elementary cells in which the outlet pressure drop (pressure drop localised in

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the extraction device) is higher than the inlet pressure drop (pressure drop localised in the feed device).

The Examiner's assumption in his analysis of D1, that "the pressure loss is smaller in the supply part and higher in the discharge part" is in fact misleading. The instant invention is directed at having higher different pressure drops (i.e., different resistance to flow, which is a specific product feature) at the cell outlet with respect to the inlet, not a higher "pressure loss" (which could be regarded as a "result to be achieved"). In a way, the "pressure drop" is a hydraulic equivalent of an electrical resistance; a narrow channel has a higher pressure drop (which is a measure of the resistance to hydraulic flow) than a larger channel, and in D2 the main outlet channel is larger (i.e. has a lower pressure drop) than the inlet channel. Hence, D2 does not anticipate the present invention either but - at most - teaches away from the invention.

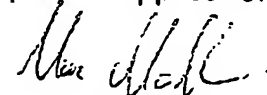
2.3 The subject matter of claim 1 is based on an inventive step.

Inventive step of claims 1-15 was challenged in view of the same documents, as they allegedly solve the same problem in a similar manner.

Applicants respectfully traverse this objection, since D1 is directed to a totally different problem (homogenising the gas delivery among different cells of a cell array rather than dealing with the inlet to outlet pressure drop ratio within each individual cell), and D2 teaches exactly the opposite of what disclosed and claimed in the present invention, as it deals with a different technical problem (homogenising the flow distribution of liquid electrolyte among different elementary cells).

The present invention solves a different problem in a different way, and is therefore inventive over D1 and D2.

In view of the above remarks and claim amendments, a new favourable IPER (at least as far as new claims 1 - 14 are concerned) is respectfully solicited for the present application.


(J. Uwe Müller)

um

encl.: complete set of amended claims 1 - 15, in triplicate

CLAIMS

1. An electrochemical generator comprised of at least one elementary cell comprising porous current collectors/distributors in correspondence of the active area, a feed device for reactant gases and an extraction device for reaction products and exhausts, wherein the pressure drops localised in the extraction device are substantially higher than said pressure drops localised in the feed device.
2. The generator of claim 1, wherein the feed device comprises a feed manifold and at least one distributing channel and that the extraction device comprises a discharge manifold and at least one collecting channel.
3. The generator of claim 2 wherein said pressure drop localised in the feed device is concentrated within said at least one distributing channel and said pressure drop localised in the extraction device is concentrated within said at least one collecting channel.
4. The generator of the previous claims wherein the pressure inside the current collectors/distributors in correspondence of the active area is substantially equivalent to the pressure in the feed device.
5. The generator of claim 4 wherein the pressure in the feed device is lower than or equal to 1.5 bar abs.

6. The generator of claims 2 to 5 wherein said at least one collecting channel has a substantially lower passage section than said at least one distributing channel.
7. The generator of claims 2 to 6 wherein said at least one collecting channel has a substantially higher length than said at least one distributing channel.
8. The generator of claims 2 to 7 comprising an amount of said collecting channels lower than the amount of said distributing channels.
9. The generator of the previous claims wherein said at least one elementary cell comprises sealing gaskets provided with centring holes symmetrical with respect to the vertical axis and asymmetrical with respect to the horizontal axis.
10. The generator of claims 2 to 9 wherein said at least one collecting channel is made hydrophobic.
11. The generator of claim 10 wherein said at least one collecting channel is made hydrophobic by applying suspensions of fluorinated polymers.
12. The generator of claim 11 wherein said fluorinated polymers are selected from the group consisting of polytetrafluoroethylene, polyvinylidenefluoride, tetrafluoroethylene-hexafluoroethylene copolymer, perfluoroalcoxy derivatives.
13. The generator of claims 2 to 12 wherein said distributing and collecting channels are obtained in the interior of sealing gaskets.

14. The generator of claims 2 to 12 wherein said distributing and collecting channels are obtained in the interior of bipolar plates delimiting the elementary cells.
15. An electrochemical generator comprised of at least one elementary cell comprising the distinctive features of the description and the drawings